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Janeiro. During these two years, 1,675 persons died from that disease; and of that number, 1,667 were unvaccinated, eight only of those who had received the treatment having died. This statement was made by Freire and others to the Academy of science. These gentlemen state, that, taking as the basis of their calculation the population exposed to the contagion, the percentage of deaths for the whole number was one per cent, whereas for those who had been subjected to preventive inoculations it was only one per thousand.

A THREE-YEAR TRANCE. — In the *Revue d'hypnotisme* is reported the case of a young lady who has been in an uninterrupted trance for nearly four years. In 1883 she received a fright, and shortly after had convulsions, from which she passed into a profound sleep which has continued to the present time. She takes food in small quantities. Dr. Bérillon, who reports the case, has, as the result of his examination, found the limbs wasted, and the fat of the body to have disappeared. Anaesthesia is complete. The pulse is very weak, and beats one hundred to the minute. The face is pale, waxy, and expressionless. She is totally unconscious, and cannot be aroused.

PURIFICATION OF SEWAGE. — L. P. Kinnicutt, professor of applied chemistry at the Worcester free institute, has recently given his opinion as to purification of the sewage of that city by means of chemical precipitation. In his report to the city engineer, he discusses the three general methods used for the purification of sewage, — irrigation, intermittent filtration, and chemical precipitation. That sewage can be purified in England by the system of broad irrigation, when the system is carefully carried out, there is no question. The amount of land required, however, is very great, probably an acre for every fifty persons. This, together with the cost of properly preparing the land, conducting the sewage thereto, and carrying the effluent away, makes the system a most costly one for a city of any size. Purification of sewage by means of intermittent filtration is an attempt to reduce the amount of land by applying the sewage intermittently, the amount of land being, as given by the most careful authorities, one acre to five hundred persons. The cost of preparing the land for this purpose is very great, as it must be deeply under-drained. The land, when used, is not well fitted for the production of crops, and the decomposition of the organic matter contained in the sewage depends almost entirely on the oxygen contained in the soil. The third method, chemical precipitation, consists in adding certain chemicals to the sewage, which precipitates practically all the suspended

matter, and which could undoubtedly be carried to a point where most of the offensive matter in solution was destroyed. The effluent obtained by this process can either be carried directly into a running stream, or first filtered through a small area of land. The recommendation of Professor Kinnicutt in reference to the best method for the purification of the sewage of Worcester is that chemical precipitation be adopted, with the addition of a small area of land, for possible use in very hot, dry weather; and, for every million gallons of sewage, the addition of about 900 pounds of quicklime for the neutralization of free acid, and 2,150 pounds in the form of milk of lime, or 1,000 pounds in the form of lime-water, for the precipitation process proper.

EXPLORATION AND TRAVEL.

Africa.

THE journal of Bishop Hannington, who was murdered in Uganda, contains some interesting notes on Masai Land, according to *Petermann's Mittheilungen* for May. His travels between the Victoria Nyanza and the Nile are important, as he was the first white man to visit that part of the country.

Count Teleki has organized an expedition to Central Africa, which left Zanzibar on Jan. 24, under the command of Lieutenant von Höhnel. The object of the expedition is the exploration of the Kilima Njaro.

Extracts from letters of H. M. Stanley, dated from the Kongo on March 20 and 21, are published in the *London Times*. The expedition arrived at Banana Point on March 18, after a pleasant and satisfactory voyage. Stanley chartered three small steamers belonging to the trading companies of the lower Kongo, and on March 20 and 21 the whole expedition was conveyed to Matadi. The expedition appears to be in a very satisfactory condition. A serious disturbance between the Zanzibari and Tippu-Tip's men on the one side, and the Sudanese on the other, was quickly suppressed; and Stanley says that later on perfect peace prevailed among the different elements composing the expedition. The news he received at Bomo from the committee in charge of the administration of the Kongo Free State was very discouraging. He was informed that a serious famine existed as far as Stanley Pool, and that the steamer Stanley is at present hauled up for repairs. Besides this, the Baptist mission refused to lend its steamer Peace to the expedition. Thus Stanley encounters numerous obstacles; but we may expect, nevertheless, to hear soon of his arrival at Stanley Pool.

As the Stanley relief expedition makes it unnecessary to send another expedition to the relief of Captain Casati, the Milan Società d'esplorazione commerciale in Africa has changed its plans, and has sent two of Tippo-Tip's men to Unyoro, bearing letters of credit for Casati to the missionary and trading stations on the route. Thus Casati will be enabled to return from Unyoro to Zanzibar, and it is probable that in this way Emin Bey will be informed of Stanley's attempt to reach him.

It is stated in *Petermann's Mittheilungen* for May that the German Reichstag has appropriated 150,000 marks (about \$36,000) for the continuation of explorations in Africa. While former appropriations were used for the expeditions of the German-African society, the government has resolved to use the present appropriation for the exploration of the German possessions in Africa. Lieut. R. Kund, the explorer of the Lukenye, will be sent to Kamerun, to penetrate from that point into the interior, which, on account of the hostility of the natives, has been hitherto inaccessible.

A. von Dankelmann has reduced the barometrical observations of R. Kund, and compared them with those obtained from the observations of von François, Dr. Büttner, and von Mechow. As stated in *Petermann's Mittheilungen*, he considers the height of Stanley Pool (900 feet) and of San Salvador (1,800 feet) reliable. The rivers Kuango, Kuilu, Sankuru, and Lukenye are from 1,050 to 1,300 feet above sea-level, the western rivers being the more elevated. This fact shows that these rivers run through an extensive plain, into which they have cut their beds.

New Guinea.

We learn from the Proceedings of the Royal Geographical society for May that the government of Victoria is preparing to send out a well-equipped expedition to explore the Owen Stanley Mountains from Port Moresby, and has offered the leadership to the man of all others best able to carry so difficult an undertaking to a successful issue; namely, the Rev. J. Chalmers. A grant of ten thousand dollars has been made towards the cost of the expedition, and further contributions are expected.

America.

Chaffanjon writes from Ciudad Bolivar to the Geographical society of Paris (*Compt. rend.*, No. 9) that the success of his expedition to the sources of the Orinoco was complete. His companions, Indians from the Maquiritares and Bares tribes, were so much afraid of the Guaharibas, who inhabit the region about the head waters of the Orinoco, that he had the greatest difficulty in inducing them to follow him. He explored the

mountains of that region, and determined the positions of numerous places by astronomical observations. He is going to visit the sources of the Essequibo before returning to France.

The expedition of Dr. K. von den Steinen, before leaving the coast of Brazil, made some anthropological and ethnological researches among the Sambuquis in the province of Santa Catharina (*Gazette géogr.*, May 12). The company intended to start for the head waters of the Xingu on the 2d of May. Although ethnological studies are the main objects of the expedition, Messrs. Gervaiso Ninus Piris and Moreira de Silva have accompanied it for the purpose of making geological observations.

NOTES AND NEWS.

THE vessels of the U. S. coast survey are now located as follows: the *Bache* left Key West May 24, and arrived at New York last Tuesday, where she will fit out for work in Vineyard Sound; the *Gedney* left New York May 30 for work on the coast of Maine; the *Olympia* is now at work on the coast of Washington Territory; the *Endeavor* is now on the Louisiana coast, but will close its work this week and proceed to New York. Mr. F. W. Perkins, who has been on the steamer *Hitchcock* on the coast of Louisiana, has dismissed his party, and will be in Washington until June 15; Mr. J. H. Turner has been ordered to Salt Lake City, and will continue the work on the triangulation of the 39th parallel; Captain Bou-telle has gone to St. Paul, Minn., to organize a party under the direction of Professor Hoag of the University of Minnesota, for making a triangulation survey of the state. The work will begin between St. Paul and Fort Snelling.

—The American fisheries society began its annual session in Washington last Tuesday. There was a large attendance of the members. The following are the officers of the society: president, Dr. W. M. Hudson, Hartford, Conn.; vice-president, W. L. May, Fremont, Neb.; treasurer, E. G. Blackford, Brooklyn, N.Y.; recording secretary, Fred Mather, Cold Spring Harbor, N.Y.; corresponding secretary, W. A. Butler, jun., Detroit, Mich. Prof. W. O. Atwater of the Wesleyan university presented a paper on "The chemical changes produced in oysters in floating, and their effect upon their nutritive value." Mr. K. Ito, superintendent of the fisheries of northern Japan, spoke upon the methods of fishing in Japan as compared with American methods.

—The fifteenth annual session of the American society of mechanical engineers began in Washington on Tuesday, May 31, over seven hundred